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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Shunpei Yamazaki

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EXAMINER

LIN, JAMES

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/769,821	Applicant(s) YAMAZAKI, SHUNPEI	
	Examiner JAMES LIN	Art Unit 1715	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 June 2011.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-9 and 12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>6/8/2011</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyakawa (U.S. Patent No. 6,051,150, listed in the IDS filed 8/19/2008) in view of Kurihara et al. (U.S. Patent No. 5,368,897), Babayan et al. (U.S. Publication No. 2002/0129902) and Mori et al. (U.S. Publication No. 2004/0209190, listed in the IDS filed 6/8/2011).

Miyakawa teaches a method of etching an ITO film of a liquid crystal display (LCD). A conductor film 17 is formed over a substrate 9. A resist mask 18 is partially formed over the conductor film. The resist is then removed after etching (col. 5, line 64-col. 6, line 4; Figs. 2A-2B). The conductor film prior to etching is being interpreted as being partially formed because the formation of the film is not finished until the etching step. The etching is performed at about atmospheric pressure (i.e., about 760 Torr) in a plasma treatment chamber (abstract). A reactive gas is discharged to region 16 in the direction of arrow B as shown in Fig. 5 (col. 6, line 59-col. 7, line 13). The plasma treatment means is provided inside the plasma treatment chamber (Figs. 1, 5, and 6).

Miyakawa teaches a plasma means, but does not explicitly that the plasma means has one set of electrodes, wherein one electrode surrounds the other electrode, providing a distal portion of the one electrode being slanted towards the other electrode and wherein the distal portion of the one electrode has a sharp angle. However, Kurihara teaches that it was well known to have used a plasma apparatus having one electrode 53 which surrounds another electrode 54. The distal portion of the one electrode is slanted toward other electrode and has a sharp angle shape (Fig. 13). Although the plasma apparatus of Kurihara was used in a deposition apparatus while the plasma apparatus of Miyakawa was used in an etching process, Babayan teaches that it was well known to have used a plasma apparatus for either etching or depositing [0006]-[0008]. The

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teachings of Babayan would have presented a recognition of equivalency in the prior art and would have presented strong evidence of obviousness in substituting one plasma means for the other in a process of forming a plasma. The substitution of equivalents requires no express suggestion. See MPEP 2144.06.II. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have used the plasma means of Kurihara, as opposed to the plasma means of Miyakawa, with a reasonable expectation of success. The selection of something based on its known suitability for its intended use has been held to support a prima facie case of obviousness (MPEP 2144.07).

Miyakawa does not explicitly teach ashing the resist mask by partially blowing the second reactive gas in the plasma treatment chamber at the pressure of 5 to 800 Torr. Miyakawa does teach removing the resist film (col. 5, line 64-col. 6, line 4), but is completely silent as to how the resist is removed. Accordingly, Mori teaches that it was well known to have removed a resist mask by ashing with a plasma from oxygen or ozone at atmospheric pressure [0146]. The processes of Mori and Miyakawa use similar pressures. Because Mori teaches that such methods were operable, it would have been obvious to one of ordinary skill in the art at the time of invention to have removed the resist of Miyakawa using an atmospheric plasma ashing method with a reasonable expectation of success. The selection of something based on its known suitability for its intended use has been held to support a prima facie case of obviousness (MPEP 2144.07).

Miyakawa and Mori do not explicitly teach that the etching and ashing can be performed in the same chamber and using the same plasma treatment means. However, one of ordinary skill in the art would have recognized that performing the two steps in the same chamber or in different chambers and using the same plasma treatment means or different plasma treatment means would have yielded a similar product. The use of the same plasma treatment means in the same chamber would have eliminated the time needed to transport the substrate to a different chamber and, thus, improve process efficiency. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have performed the etching of Miyakawa and the ashing of Mori in the same treatment chamber using the same plasma treatment means with a reasonable expectation of success. One would have been motivated to do so in order to have increased throughput.

Claim 6: Miyakawa does not explicitly teach that the size of the LCD substrate has a size of 1,000 x 1,200 mm² or more. However, Miyakawa recognizes that the size of LCD panels is continually increasing in size and that the method of etching accommodates for the continual increase (col. 9, lines 21-24). One of ordinary skill in the art would have recognized that the process of Miyakawa would have provided an operable method for etching an ITO film at these increased sizes with predictable results. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have performed the ITO etching method of Miyakawa on any substrate size, including those within the claimed range, with a reasonable expectation of success.

3. Claims 1 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyakawa '150 in view of Kurihara '897, Babayan '902 and Mori '190 as applied to claim 4 above, and further in view of Seki (JP 11-340129, listed in the IDS filed 2/23/2005).

Miyakawa does not explicitly teach that the resist mask is formed by use of liquid droplet jetting means. In fact, Miyakawa is completely silent as to how the resist film is formed. Accordingly, Seki teaches that a resist material can be dissolved in a solvent and deposited onto a substrate via an ink jet method. This method can provide a manufacturing process at low costs (abstract). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have formed the resist mask of Miyakawa using an ink jet method as the particular resist film forming method with a reasonable expectation of success. One would have been motivated to do so in order to have used a low cost manufacturing method.

4. Claims 5, 7-8, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyakawa '150 in view of Kurihara '897, Babayan '902 and Mori '190 as applied to claim 4 above, and further in view of Inoue (JP 07-024579, listed in the IDS filed 2/23/2005).

Miyakawa and Kurihara do not explicitly teach using a plurality of sets of electrodes for generating plasma. However, Inoue that it was well known to have used a plurality of plasma jets to etch multiple substrates. The apparatus comprises of a plurality of plasma generating electrodes, which can be moved in the X and Y directions (abstract; Fig. 1). The processing of multiple substrates would have decreased production time and reduced costs. Therefore, it

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would have been obvious to one of ordinary skill in the art at the time of invention to have used a plurality of sets of electrodes to process multiple substrates of Miyakawa with a reasonable expectation of success. One would have been motivated to do so in order to have improved process efficiency and reduce operating costs.

Claims 7-8: Inoue teaches that the plasma treatment means can scan the substrate in the X and Y directions (Fig. 1).

Claim 12: Inoue teaches that the plasma treatment means can move along a rail (Fig. 1).

5. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyakawa '150 in view of Kurihara '897, Babayan '902, Mori '190 and Seki '129 as applied to claim 1 above, and further in view of Inoue '579 for substantially the same reasons as discussed for claim 5 above.

Double Patenting

6. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

7. Claims 4 and 6 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 5, 10, 15, 19 and 23 of U.S. Patent No. 7,189,654 in view of Kurihara '897 and Babayan '902.

The claims of '654 do not require providing one electrode of the set of electrodes which surrounds the other electrode of the set of electrodes and wherein a distal portion of each of the other electrode of the set of electrodes has a sharp angle shape. However, Kurihara teaches that it was well known to have used a plasma apparatus having one electrode 53 which surrounds another electrode 54. The distal portion of the one electrode is slanted toward other electrode and has a sharp angle shape (Fig. 13). Although the plasma apparatus of Kurihara was used in a deposition apparatus while the plasma apparatus of '654 was used in an etching process, Babayan teaches that it was well known to have used a plasma apparatus for either etching or depositing [0006]-[0008]. Thus, Babayan would have presented a recognition of equivalency in the prior art and would have presented strong evidence of obviousness in substituting one plasma means for the other in a process of forming a plasma. The substitution of equivalents requires no express suggestion. See MPEP 2144.06.II. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have used the plasma means of Kurihara, as opposed to the plasma means of '654, with a reasonable expectation of success. The selection of something based on its known suitability for its intended use has been held to support a prima facie case of obviousness (MPEP 2144.07).

Claim 6: '654 does not require that the substrate has a size of 1,000 x 1,200 mm² or more. However, the size of the substrate is merely a design choice and can be altered merely for aesthetic purposes. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have modified the substrate size, including to a size within the claimed range, with a reasonable expectation of success and with predictable results.

8. Claims 1 and 9 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 5, 10, 15, 19 and 23 of U.S. Patent No. 7,189,654 in view of Kurihara '897 and Babayan '902 as applied to claim 4 above, and further in view of Seki '129.

'654 does not require the resist mask to be formed by use of liquid droplet jetting means. However, Seki teaches that a resist material can be dissolved in a solvent and deposited onto a substrate via an ink jet method. This method can provide a manufacturing process at low costs (abstract). Therefore, it would have been obvious to one of ordinary skill in the art at the time of

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invention to have formed the resist mask of '654 using an ink jet method as the particular resist film forming method with a reasonable expectation of success. One would have been motivated to do so in order to have used a low cost manufacturing method.

9. Claims 5, 7-8, and 12 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 5, 10, 15, 19 and 23 of U.S. Patent No. 7,189,654 in view of Kurihara '897 and Babayan '902 as applied to claims 1 and 4 above, and further in view of Inoue '579.

'654 does not require the use of a plurality of sets of electrodes. However, Inoue teaches a method of generating plasma in restricted regions (abstract). The apparatus comprises of a plurality of plasma generating electrodes, which are moved in the X and Y directions such that an etching pattern can be formed (Fig. 1). Because Inoue teaches that such a method was operable for selectively plasma etching a substrate, it would have been obvious to one of ordinary skill in the art at the time of invention to have applied the plasma etching apparatus of Inoue to the plasma etching method of '654 with a reasonable expectation of success. The selection of something based on its known suitability for its intended use has been held to support a prima facie case of obviousness. *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945).

10. Claim 2 is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 5, 10, 15, 19 and 23 of U.S. Patent No. 7,189,654 in view of Kurihara '897, Babayan '902 and Seki '129 as applied to claim 1 above, and further in view of Inoue '579.

Response to Arguments

11. Applicant's arguments filed 6/8/2011 have been fully considered but they are not persuasive.

Applicant argues on pg. 2-4 that Miyakawa's etching at atmospheric pressure and Mori '879's "ashing" are absolutely different from Kawase's "atmospheric plasma ashing". However, Mori '190 listed in the IDS filed 6/8/2011 provides a better teaching of ashing a mask. Mori

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‘190 teaches that it was well known to have removed a resist mask by ashing with a plasma from oxygen or ozone at atmospheric pressure [0146]. The processs of Mori ‘190 and Miyakawa use similar pressures. Because Mori ‘190 teaches that such methods were operable, it would have been obvious to one of ordinary skill in the art at the time of invention to have removed the resist of Miyakawa using an atmospheric plasma ashing method with a reasonable expectation of success. The selection of something based on its known suitability for its intended use has been held to support a prima facie case of obviousness (MPEP 2144.07). The teaching of Mori ‘190 is replacing the teachings of Mori ‘879 and Kawase.

Applicant argues on pg. 4 that the present claims are patentably distinct from the claims of Yamazaki. However, the main difference between the present claims and that of Yamazaki is that the claims of Yamazaki do not require providing one electrode of the set of electrodes which surrounds the other electrode of the set of electrodes and wherein a distal portion of each of the other electrode of the set of electrodes has a sharp angle shape. However, Kurihara teaches that it was well known to have used a plasma apparatus having one electrode 53 which surrounds another electrode 54. The distal portion of the one electrode is slanted toward other electrode and has a sharp angle shape (Fig. 13). Although the plasma apparatus of Kurihara was used in a deposition apparatus while the plasma apparatus of Yamazaki was used in an etching process, Babayan teaches that it was well known to have used a plasma apparatus for either etching or depositing [0006]-[0008]. Thus, Babayan would have presented a recognition of equivalency in the prior art and would have presented strong evidence of obviousness in substituting one plasma means for the other in a process of forming a plasma. The substitution of equivalents requires no express suggestion. See MPEP 2144.06.II. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have used the plasma means of Kurihara, as opposed to the plasma means of Yamazaki, with a reasonable expectation of success. The selection of something based on its known suitability for its intended use has been held to support a prima facie case of obviousness (MPEP 2144.07). Thus, the present claims are not patentably distinct from the claims of Yamazaki.

Applicant argues that the Office Action fails to set forth detailed arguments explaining how “after switching the first reactive gas to a second reactive gas, partially ashing the resist mask by discharging a plasma to the plasma treatment chamber from the plasma treatment means

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in the plasma treatment chamber at the pressure of 5 to 800 Torr from the second reactive gas introduced to the plasma treatment means" is rendered obvious over Yamazaki. However, Yamazaki requires "ashing the first resist mask and the second resist mask with the plasma generating means under the atmospheric pressure or a pressure close to the atmospheric pressure" (emphasis added). The plasma ashing process of Yamazaki necessarily requires a reactive gas because a plasma process necessarily requires the use of a gas to generate the plasma. Additionally, the resist mask will be at least partially ashed during the ashing step and before the ashing step is completed.

Conclusion

12. Applicant's submission of an information disclosure statement under 37 CFR 1.97(c) with the fee set forth in 37 CFR 1.17(p) on 6/8/2011 prompted the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 609.04(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAMES LIN whose telephone number is (571)272-8902. The examiner can normally be reached on Monday thru Friday 8AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/James Lin/
Examiner, Art Unit 1715